REMARKS

Prior to the present Amendment, claims 1-15 were pending in the Application. Claims 1, 2, 7, 8, 9, and 12-15 have been amended. New claims 16-18 have been added. Thus, claims 1-18 are presented for consideration. No new matter has been added to the Application.

Claims 1-13 and 15 stand rejected under 35 U.S.C. § 101 as allegedly not providing a tangible result. Claims 1 and 15 have been amended herein to comply with 35 U.S.C. § 101. Thus, the Examiner's rejection of claims 1 and 15 under 35 U.S.C. § 101 should be withdrawn and this action is respectfully requested.

Claims 1-3 and 10-15 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,289,232 to Jakob et al. (hereinafter "Jakob").

Claims 4-9 have been objected to as being dependent on a rejected base claim but deemed allowable if rewritten in independent form. Applicants graciously acknowledge the Examiner's determination of the allowability of claims 4-9.

The rejection of claims 1-3 and 10-15 under 35 U.S.C. § 102(b) based on Jakob is traversed with respect to the claims as amended herein and reconsideration is respectfully requested.

Jakob discloses a magnetic resonance imaging apparatus which uses a SMASH imaging technique wherein the MRI processor fits coil sensitivities to produce spatial harmonic signals to fill additional lines in k-space, so that a sparse or reduced set of gradient conditioning steps may be used while still filling the entire data set. (See, Jakob, col. 8, ll. 45 - 52). Instead of measurement of coil sensitivities, autocalibration signals (ACS) are use which are acquired with a small number of additional conditioning or gradient steps, and serve as a navigator measurement. The ACS

lines represent signals at intermediate positions in k-space, which are spatially encoded in a conventional manner using gradients. (Jakob, col. 8, ll. 52 - 62). The SMASH procedure operates by forming combinations in signal space, of the signals simultaneously acquired in multiple surface coils that have different spatial sensitivities. These combinations are used to reconstruct or synthesize a set of signals which would have been acquired with a different phase encoding step. (Jakob, col. 9, ll. 18 - 24).

In contrast, amended claim 1 of the present Application recites a magnetic resonance imaging method for producing one or more magnetic resonance images of a region of a subject including the steps of, acquiring spatially encoded magnetic resonance signals from one or more receiver antennae, and reconstructing the image from the spatially encoded magnetic resonance signals wherein the reconstructing includes optimizing a spatial response function (SRF) individually for each pixel in the image, wherein the SRF is defined by the spatial signal response from the subject to be imaged.

As set forth in the Application, the SRF of each pixel reflects the spatial weighting of the MR signal in the pixel value. The spatial response function is different for each pixel in the image. As recited in amended claim 1, the image is reconstructed from spatially encoded magnetic resonance signals by optimizing the spatial response function of the individual pixels in the image. As set forth in the specification, this is achieved by defining a penalty function that measures the defects of any potential spatial response function and then calculating each pixel value such that the penalty is minimal, i.e., the smallest possible. Because the result is only the optimal image, the actual reconstruction procedure performs this optimization implicitly, such that the spatial response is not actually calculated.

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Nothing in the Jakob reference teaches or suggests optimizing the spatial response relative to each pixel in the image. To support the rejection based on Jakob, the Examiner has identified column 9, lines 18-39 of Jakob, alleging that Jakob discloses optimizing the spatial response function of the individual pixel in the image as recited in Applicant's claim 1. (See, Office Action, p. 3, ll. 1-7). Clearly, the Examiner has misinterpreted the Jakob reference. The identified portion of Jakob merely describes the SMASH procedure wherein combinations in signal space of the signals simultaneously acquired in multiple surface coils that have different spatial sensitivities are combined and used to reconstruct or synthesize a set of signals which would have been acquired with a different phase encoding step. Nothing in the Jakob excerpt cited by the Examiner, nor the remainder of the Jakob reference teaches or suggests optimizing the spatial response function of the individual pixels in the image as set forth above and recited in Applicants' claim 1.

For at least the above-identified reasons, the Jakob reference does not teach or suggest each and every element of the Applicant's claim 1 as arranged in the claim. Thus, amended claim 1 is not anticipated by the Jakob reference and the rejection of claim 1 under 35 U.S.C. §102 (b) should be withdrawn.

Additionally, pending claims 2-12 depend either directly or indirectly from claim 1 and thereby incorporate all of the limitations of claim 1 and also recite additional limitations. Since, for at least the above-identified reasons, amended claim 1 is not anticipated by Jakob, dependent claims 2-12 are also deemed not anticipated by Jakob. Therefore, it is respectfully submitted that the rejection of claims 2-12 under 35 U.S.C. § 102(b) should also be withdrawn.

Each of independent claims 14 and 15 also include a limitation directed to reconstructing the image based on optimization of the spatial response function for

each pixel in the image as discussed above with respect to claim 1. Accordingly, for at least the reasons set forth above with respect to claim 1, claims 14 and 15 are also not anticipated under 35 U.S.C. § 102(b) by the Jakob reference. Thus, the rejection of claims 14 and 15 under 35 U.S.C. § 102(b) should also be withdrawn.

New claims 16-18 each depend from one of claims 14 and 15 and are therefore also deemed patentable over the Jakob reference for at least the reasons set forth above for claims 14 and 15.

In view of the foregoing, it is respectfully submitted that claims 1-18 are allowable. All issues raised by the Examiner having been addressed herein, an early action to that effect is earnestly solicited.

PETITION FOR EXTENSION OF TIME TO RESPOND

Pursuant to 37 CFR 1.136(a), Applicant hereby requests a three-month extension for filing a reply to the Office Action of February 22, 2007, thereby extending the period to respond through August 22, 2007. We have authorized payment of the $510.00 extension fee from our deposit account. No additional fees or deficiencies in fees are believed to be owed. However, authorization is hereby given to charge our Deposit Account No. 13-0235 in the event any such fees are owed.

Respectfully submitted,

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